

REMARKS

Currently, claims 1-20 are pending in the present application, including independent claim 1. Claims 12-14 are currently withdrawn.

Election/Restriction

Applicants affirm the election of Group 1 (claims 1-11 and 15-17).

Specification

Applicants have added section headings where appropriate.

Claim Rejections – 35 U.S.C. § 103

In the Office Action, claims 1-5, 7-11, 15, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,937,028 to Glemet in view of U.S. Patent No. 6,369,157 to Winckler and further in view of U.S. Patent No. 6,090,319 to Sharma. Glemet is directed to a process for producing thermoplastic resins reinforced with long fibers. In a first stage, the fibers pass over a baffle which applies a force in order to spread the fibers. The fibers are then impregnated with a thermoplastic resin. The impregnated fibers then enter a molding die. Upon exit from the molding die, the fibers are additionally coated with a thermoplastic resin. Winckler is directed to a blend material. The blend comprises macrocyclic polyester oligomers and a polymerization catalyst. Winckler discloses that the blend may be utilized in a pultrusion process in which a fiber is pulled through a die and coated with the polyester oligomer and the polymerization catalyst. The die is heated “to cause polymerization of the macrocyclic polyester oligomer forming (a) high molecular weight polyester resin matrix around the fibrous strand.” Col. 18, lines 2-4. Sharma discloses a fiber reinforced thermoplastic structure in which an additive is added to the second die.

Independent claim 1 requires at least one catalyst which catalyzes the formation of covalent bonds between the thermoplastic polymer and the multifilament strands. Contrary to that asserted in the Office Action, Winckler fails to disclose or suggest such a limitation. Indeed, as disclosed in Winckler the polyester oligomers are polymerized “around the fibrous strand.” Col. 18, line 4. Winckler fails to disclose any motivation or suggestion to utilize a combination of fibers, thermoplastic, and catalyst which form covalent bonds linking the thermoplastic polymer to the surface of the multifilaments. Independent claim 1 has been amended to further clarify this structure.

Furthermore, Winckler simply discloses a one step process in which the catalyst is utilized to form the thermoplastic polymer around the fiber. In stark contrast, Applicants utilize a catalyst to form covalent bonds between the fibers and the thermoplastic in the impregnation step. As taught by Applicants, the covalent bonds are formed prior to the material’s exit from the impregnator. Pg. 7, lines 15-18. Afterwards, the fiber is sheathed with a second thermoplastic polymer. Thus, in further contrast to Winckler, Applicants utilize the catalyst during the impregnation step, rather than the sheathing step.

Additionally, dependent claim 5 requires that the catalyst catalyzes transesterification, transamidation, or transurethanization reactions, or which catalyzes the formation of ester groups, amide groups, or urethane groups. The Office Action indicates that Winckler discloses a transesterification catalyst at Col. 5, line 51. Applicants respectfully disagree. Winckler discloses:

Another method for preparing macrocyclic polyester oligomers or macrocyclic copolyester oligomers is to depolymerize linear polyester polymers in the presence of an organotin or titanate compound. In this

method, linear polyesters are converted to macrocyclic polyester oligomers by heating a mixture of linear polyesters, an organic solvent, and a transesterification catalyst such as a tin or titanium compound. Col. 5, lines 45-52.

As such, Winckler simply discloses a process for forming the macrocyclic polyester oligomers to be utilized in the blend. Winckler fails to disclose a catalyst that catalyzes a transesterification reaction between the fibers and the thermoplastic as alleged by the Office Action.

New claim 18 requires that the covalent bonds linking the thermoplastic polymer to the surface of the multifilaments are formed via a reaction of reactive groups of the thermoplastic with reactive groups on the surface of the multifilaments or by utilizing a coupling agent. As noted above, the cited references fail to disclose or suggest such a limitation.

New claim 19 requires the first thermoplastic molding composition to comprise a polyoxymethylene homo or copolymer. None of the references disclose a polyoxymethylene homo or copolymer, let alone a polyoxymethylene utilized in the first thermoplastic molding composition.

New claim 20 requires the thermoplastic molding composition comprises a catalyst from 0.00001% to 0.5% by weight and an antioxidant additive from 0.01% to 1.0% by weight. None of the references disclose or suggest such a limitation.

As such, it is believed that the present application is in complete condition for allowance and favorable action is respectfully requested. Examiner Le is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

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